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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/536,762

11/30/2005

Nigel Paul Schofield

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EXAMINER

BOBISH, CHRISTOPHER S

ART UNIT

PAPER NUMBER

4135

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/536,762	Applicant(s) SCHOFIELD, NIGEL PAUL	
	Examiner CHRISTOPHER BOBISH	Art Unit 4135	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05/26/2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>05/26/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Objections

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "**means**" and "**said**," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 9-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Stones (United States Patent No. 6,135,709).

Stones teaches:

Art Unit: 4135

limitations from claim 9, a method of controlling pressure in a chamber connected to an inlet of a vacuum pumping arrangement including a backing pumping mechanism, **FIG. 3 (1) C. 2 Lines 5-6**, and a molecular pumping mechanism, **FIG. 3 (50) C.2 Lines 61-63**, and a motor for driving the backing pumping mechanism, **FIG. 1 (7) C. 2 Lines 13-15**, the method comprising using the motor to control rotation of the molecular pumping mechanism thereby controlling pressure in the chamber;

limitations from claim 10, a method as claimed in claim 9, wherein the backing pumping mechanism and the molecular pumping mechanism are coupled to a common drive shaft and the method comprises using the motor to control rotation of the common drive shaft thereby controlling pressure in the chamber; **Stones teaches a common rotor, FIG. 3 (9), coupling the two mechanisms to the shaft, the molecular section, FIG. 3 (52) C. 2 Lines 65-68, and the regenerative (backing) section, FIG. 1 (9) or FIG 3 (9) C. 2 Lines 47-51; so it is inherent that the motor will drive both sections, thereby controlling a pressure in a chamber;**

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 6-8, 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stones (United States Patent No. 6,135,709) in view of Curry et al (United States Patent No. 6,739,840 B2).

Stones teaches:

Art Unit: 4135

limitations from claim 1, a vacuum pumping arrangement for controlling pressure in a chamber, comprising a molecular pumping mechanism, **FIG. 3 (50) C.2 Lines 61-63**, and a backing pumping mechanism, **FIG. 3 (1) C. 2 Lines 5-6**, the backing pumping mechanism being rotatable by a motor, **FIG. 1 (7) C. 2 Lines 13-15**, the motor being arranged to rotate the molecular pumping mechanism simultaneously with the backing pumping mechanism; **Stones teaches a common rotor, FIG. 3 (9), coupling the two mechanisms to the shaft, FIG. 1 (6), the molecular section, FIG. 3 (52) C. 2 Lines 65-68, and the regenerative (backing) section, FIG. 1 (1) or FIG 3 (1) C. 2 Lines 47-51; so it is inherent that the motor will drive both sections simultaneously;**

Stones does not teach a means of controlling rotational speeds of the mechanisms of claim 1, but Curry does.

Curry teaches a control means, **FIG. 1 (177) C. 6 Lines 28-33**, for controlling rotational speeds of the molecular pumping mechanism; **Curry teaches the use of his control means with staged or cooperative pumping arrangements as well; furthermore, both mechanisms (backing, molecular) are attached to a single shaft and motor so that if one speed is controlled then the other speed must also be controlled. C. 5 Lines 37-57, 50-52;**

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the control apparatus taught by Curry with the Vacuum pump taught by Stones to create a more energy efficient pump as well as a more adaptable pump. Curry provides motivation in C. 1 Lines 18-53;

Stones and Curry teach and disclose the pumping arrangement of claim 1 and Stones further discloses;

limitations from claim 2, the vacuum pumping arrangement as claimed in claim 1, wherein the molecular pumping mechanism and the backing pumping mechanism are driven by a common drive shaft which is driven by the motor; **Stones teaches a common rotor, FIG. 1 (9), coupling the two mechanisms to the shaft, FIG. 1 (6), the molecular section, FIG. 3 (52) C. 2 Lines 65-68, and the regenerative (backing) section, FIG. 1 (9) or FIG 3 (9) C. 2 Lines 47-51; so it is inherent that the motor will drive both sections;**

limitations from claim 3, the vacuum pumping arrangement as claimed in claim 1, wherein the molecular pumping mechanism comprises a molecular drag pumping mechanism; **FIG. 3 (2) C. 2 Lines 5-8;**

Art Unit: 4135

limitations from claim 4, the vacuum pumping arrangement as claimed in claim 3, wherein the molecular drag pumping mechanism comprises a Holweck pumping mechanism; **FIG. 3 (2) C. 2 Lines 18-25;**

limitations from claim 6, the vacuum pumping arrangement as claimed in claim 1, wherein the molecular pumping mechanism comprises a turbomolecular pumping means; **FIG. 3 (50) C.2 Lines 61-63.**

limitations from claim 7, the vacuum pumping arrangement as claimed in claim 1, wherein the backing pumping mechanism is a regenerative pumping mechanism; **FIG. 3 (1) C. 2 Lines 5-6;**

limitations from claim 11, a vacuum pumping arrangement as claimed in claim 3, wherein the molecular pumping mechanism comprises a turbomolecular pumping means; **FIG. 3 (50) C. 1 Lines 27-30;**

limitations from claim 12, a vacuum pumping arrangement as claimed in claim 4, wherein the molecular pumping mechanism comprises a turbomolecular pumping means, **FIG. 3 (50) C. 1 Lines 27-30 and 36-39;**

limitations from claim 13, a vacuum pumping arrangement as claimed in claim 6, wherein the backing pumping mechanism is a regenerative pumping mechanism; **FIG. 3 (1) C. 2 Lines 5-6;**

Stones and Curry teach and disclose the vacuum pumping arrangement of claim 13 but Stones does not teach a means to control the pump speed. Curry does.

Curry further teaches:

limitations from claim 14, a vacuum pumping arrangement as claimed in claim 13, wherein the control means, **FIG. 1 (177) C. 6 Lines 28-33**, comprises means for measuring the pressure in the chamber, **C. 3 Lines 63-67**, and means for changing the rotational speeds of the molecular pumping mechanism and the backing pumping mechanism, **C. 5 Lines 37-57**, in dependence on the measured pressure, **C. 9 Lines 9-1;**

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the control apparatus taught by Curry with the Vacuum pump taught by Stones to create a more energy efficient pump as well as a more adaptable pump. Curry provides motivation in C. 1 Lines 18-53;

Art Unit: 4135

limitations from claim 15, a vacuum pumping arrangement as claimed in claim 11, wherein the backing pumping mechanism is a regenerative pumping mechanism; **FIG. 3 (1) C. 2 Lines 5-6;**

limitations from claim 16, a vacuum pumping arrangement as claimed in claim 12, wherein the backing pumping mechanism is a regenerative pumping mechanism; **FIG. 3 (1) C. 2 Lines 5-6;**

Stones and Curry teach and disclose the vacuum pumping arrangement of claim 1 but Stones does not teach a means to control the pump speed. Curry does.

Curry further teaches:

limitations from claim 8, the vacuum pumping arrangement as claimed in claim 1, wherein the control means, **FIG. 1 (177) C. 6 Lines 28-33**, comprises means for measuring the pressure in the chamber, **C. 3 Lines 63-67**, and means for changing the rotational speeds of the molecular pumping mechanism and the backing pumping mechanisms, **C. 5 Lines 37-57**, in dependence on the measured pressure, **C. 9 Lines 9-17;**

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the control apparatus taught by Curry with the Vacuum pump taught by Stones to create a more energy efficient pump as well as a more adaptable pump. Curry provides motivation in C. 1 Lines 18-53;

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stones (United States Patent No. 6,135,709) in view of Curry et al (United States Patent No. 6,739,840 B2) as applied to claim 1 above, in further view of Schofield (United States Patent No. 5,772,395).

Stones and Curry disclose and teach the vacuum pump of claim 1 but do not teach a carbon fiber reinforced cylinder for use in the Holweck pump section. Schofield does.

Schofield teaches:

Art Unit: 4135

limitations from claim 5, the vacuum pumping arrangement as claimed in claim 4, wherein a holweck cylinder of the Holweck pumping mechanism is formed from carbon fiber reinforced material; **C. 2 Lines 3-6. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use this material in the pump taught by Stones to increase durability and wear resistance while also decreasing weight.**

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER BOBISH whose telephone number is (571)270-5289. The examiner can normally be reached on Monday through Thursday, 7:30 - 5:00, most Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Brewster can be reached on (571) 272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christopher Bobish/
Examiner, Art Unit 4135

/C. B./
Examiner, Art Unit 4135

/William M. Brewster/
Supervisory Patent Examiner, Art Unit 4135